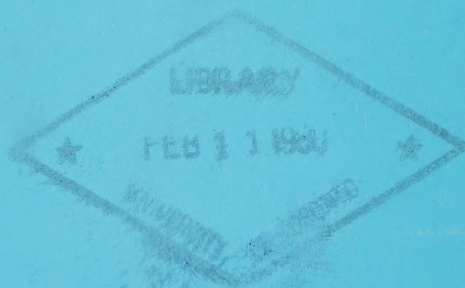


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Canada and the WMO

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Canada and the World Meteorological Organization

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The World Meteorological Organization is one of 11 Specialized Agencies linked with the United Nations through special agreements with the Economic and Social Council.

History

Weather and climate move across the earth's surface without regard for national boundaries, thereby creating similar problems all over the world. Realizing that large-scale international co-operation was necessary to solve these problems, the nations of the world have made a common effort to apply the available knowledge of the weather and its evolution to the main activities of man. Canada, occupying as it does a considerable portion of the northern hemisphere, including a large part of the meteorologically-vital Arctic, became one of the earliest participants in this international exchange of weather data.

From 1853 on, efforts were made to draw up a program of meteorological observations over the oceans, based on the collaboration of the ships of most of the maritime countries. The First International Meteorological Congress, held in Vienna in 1873, marked the beginning of organized international co-operation in meteorology. In 1878, the International Meteorological Organization, composed of directors of national meteorological services, was created

during an international conference at Utrecht in the Netherlands. The Meteorological Service of Canada, established in 1839, was not represented at this meeting, but the head of the Canadian Meteorological Service, C. Carpmael, sent a full report of the state of the Canadian service to the second meeting of the International Committee, held at Copenhagen in 1882.

During the present century, the development of transport and communications (sea- and air-navigation, radiotelegraphy and, more recently, meteorological and communications satellites) and the increased requirements of modern economic activity have given rise to a large number of technical problems, as well as unprecedented opportunities for improvement. A universal appreciation of the importance of meteorology, coupled with developments in technology, has enabled this relatively young science to make rapid progress. The new developments showed that reorganization at an international level was necessary in view of the increased interest in meteorology.

Consequently, the Conference of Directors of the National Meteorological Services, which met at Washington in 1947 under the auspices of the International Meteorological Organization, adopted the World Meteorological Convention, which set up

a new organization founded on an agreement between governments. On April 4, 1951, the World Meteorological Organization came into being, the IMO having been dissolved, and later that year was recognized by the United Nations as a Specialized Agency.

Purpose

The aims of the WMO are:

- (1) to facilitate international co-operation in the establishment of networks of stations and centres to provide meteorological and hydrological services and observations;
- (2) to promote the establishment and maintenance of systems for the rapid exchange of meteorological and related information;
- (3) to promote standardization of meteorological and related observations and ensure the uniform publication of observations and statistics;
- (4) to further the application of meteorology to aviation, shipping, water problems, agriculture and other human activities;
- (5) to promote activities in operational hydrology and to further close co-operation between meteorological and hydrological services;
- (6) to encourage research and training in meteorology and, as appropriate, in related fields.

Structure and membership

The administrative and technical machinery of the WMO consists of:

- (1) A World Meteorological Congress in which 146 member countries and territories are represented by the heads of their meteorological services. It meets once every four years to establish the program for the next four, to adopt technical regulations on meteorological practices and procedures and to determine general policy. The Seventh Congress was held in Geneva from April 28 to May 23, 1975.
- (2) An Executive Committee that supervises the carrying-out of resolutions of the Congress, initiates studies and makes recommendations on matters requiring international action. It meets at least once a year, its members being the president and the three vice-presidents of the WMO, the presidents of the six regional associations of the WMO, and 14 elected members.
- (3) Six regional associations (for Africa, Asia, South America, North and Central America, Europe and the Southwest Pacific), composed of member countries whose meteorological networks lie in or extend into the region. Canada is one of the 20 members of Regional Association IV (North and Central America).

- (4) Eight technical commissions established by the Congress to study and make recommendations on: aeronautical, agricultural and marine meteorology; operational hydrology; special applications of meteorology and climatology; basic systems; instruments and methods of observation; and atmospheric sciences.
- (5) A secretariat located in Geneva with about 230 staff members under the direction of a secretary-general.

Budget and finances

The WMO operates on a four-year financial period. The Congress sets the maximum expenditures for the financial period and authorizes the Executive Committee to approve appropriations within these limits for each financial year of the period. The budget approved for 1978 was \$11,824,000 (U.S.). Canada's contribution in 1978 amounted to \$280,000 or 2.37 per cent of the whole.

Major programs

The World Weather Watch is the basic program of the organization, on which the success of other program activities is largely dependent. It has three components. The first is the Global Observing System, which consists of the arrangements for obtaining meteorological observations

from all sources — including land stations, merchant and special ships, aircraft and, in recent years, special meteorological satellites. The analysis and processing of these observations by world, regional and national meteorological centres is the second component of the WWW — the Global Data-Processing System. The exchange of raw and processed data between the countries of the world is effected by the Global Telecommunication System, the third component of the WWW.

The intent of the WWW is to establish throughout the world facilities meeting minimum standards for weather observations, data-processing, communications, education, training and research. All activities under the WWW on the territory of individual members are, in principle, the responsibility of the member countries themselves. Where national resources are inadequate, financing from outside is arranged by bilateral or multilateral agreements, through the United Nations Development Program (UNDP) or, where necessary, through a WMO voluntary-assistance program (VAP). WWW implementation in regions outside national sovereignty (the oceans, Antarctica, outer space) is based on voluntary participation by members. The Research and Development Program includes all activities relating to the improvement of

the scientific understanding of atmospheric processes. A major feature of the WMO's research effort is the Global Atmospheric Research Program, which is sponsored jointly by the WMO and the International Council of Scientific Unions. Its purpose is to study the physical processes in the atmosphere with a view to increasing the accuracy of forecasting over periods ranging from a single day to several weeks and to obtaining a better understanding of the physical basis of climate. Other components of this program include activities in such fields as weather-modification (including precipitation-enhancement), tropical meteorology and studies of atmospheric pollution, including studies on stratospheric ozone and the possibility of climatic change. Much attention is now being given to climatic change and variability, and it is expected that, at its next session (Geneva, May 1979), the Congress will adopt a plan for a world climate program.

The Meteorological Applications and Environment Program includes all activities aimed at applying meteorological knowledge to human activities. Such applications include agriculture, oceanic matters, aviation, atmospheric and marine pollution, solar and wind energy and tropical cyclones.

The Hydrology and Water Resources Development Program is a relatively new one. Its main components are: technical projects within the Operational Hydrology Program; institutionalized co-operation of hydrological services on regional and global levels; and participation in the water-resources development programs of other organizations, such as the International Hydrology Program of the United Nations Educational, Scientific and Cultural Organization. A Hydrological Operational Multipurpose System is currently under development and, when implemented, will service water-resources management programs and projects in need of real-time and/or historical data for design purposes.

The WMO plays an active part in programs of technical co-operation and assistance for economic development, using primarily UNDP funds. It provides advice on the establishment and development of national meteorological services and promotes the training of meteorologists and specialists in all branches of weather science. Experts contribute their experience and skills and co-operate with national authorities in solving the problems of the countries concerned. One of the greatest and most pressing needs of the meteorological and hydrological services of the developing countries is

the training of an adequate number of personnel. Hence, UNDP- and VAP- funded activities in education and training receive high priority. Their main features are the granting of fellowships, the establishing of meteorological training-centres, the holding of seminars and symposia and the preparing of special publications, including new syllabuses and lecture notes for training in specialized fields of meteorology. The WMO also participates in the implementation of environmental programs under the co-ordination of the United Nations Environment Program, at both the global and regional levels.

The *WMO Bulletin* keeps members and all interested persons informed of the organizations's activities and of new developments in meteorology generally.

By taking part in the sessions of the World Meteorological Congress, the technical commissions and the Regional Association for North and Central America, as well as in numerous panels and working groups established by the constituent bodies, Canadians have made substantial contributions to the planning and development of the WMO's major programs.

The Atmospheric Environment Service (formerly the Canadian Meteorological Service) has always played an active part in international meteorology. Canada has acted as host to several meetings of the WMO technical commissions over the years. Canada is represented on all of the technical commissions and has the distinction (as of February 1, 1978) of having Canadians presiding over three of the eight commissions.

The head of the Atmospheric Environment Service is the Permanent Representative of Canada to the WMO and is currently an elected member of the WMO Executive Committee.

The Atmospheric Environment Service is responsible for providing the additional observing stations needed in accordance with the World Weather Watch plan. Since 1965, the

Canadian Government has contributed \$500,000 to assist developing countries in the implementation of improvements required of them by the WWW plan.

Canadian ships on the high seas report their weather by radio to the nearest land-station, and receive in return forecasts and storm-warnings for the area through which they are sailing. Vessels of foreign registry frequently provide reports of their local weather to Canadian coastal stations, and receive in return Canadian forecasts and storm-warnings for marine areas along the Atlantic and Pacific coasts of Canada. Under the aegis of the WMO, there has been an increase in international co-operation by the facsimile exchange of analyzed weather-maps among the countries of the northern hemisphere.

Through the good offices of the WMO, there exists an agreement to operate oceanic weather-stations aboard ships located in the Atlantic and Pacific. Reports from these vessels greatly facilitate transoceanic

flights by Canadian air-carriers. Canada operates "Station Papa" in the Pacific, 900 miles west of Vancouver.

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The meteorological history of Canada and of other WMO members is filled with almost daily examples of the benefits of international co-operation in meteorology. The tracking and forecasting of the life-history of hurricanes (e.g. "Hazel" in October 1954) and of severe storms such as the blizzard that struck the lower Great Lakes on January 26, 1978, constitute a tribute to the co-operation achieved internationally through the World Meteorological Organization.



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